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THE SPECIES OF *MATUS*, A GENUS OF CARNIVOROUS WATER-BEETLES (COLEOPTERA, DYTISCIDAE) *

BY HUGH B. LEECH,
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The species of the genus *Matus* are as yet known only from America north of Mexico and may be separated from all other Dytiscidae of this area by the following combination of characters: Length 7 to 9.5 mm.; color brownish-red to piceous; scutellum visible; eyes emarginate above the bases of the antennae; metatarsal claws of unequal length; *prosternum and its process on a plane, almost flat, and with a longitudinal median sulcus.*

The genus *Matus* was proposed by Aubé (1836:189) † for the *Colymbetes bicarinatus* of Say, which is thus the genotype. Clark (1863:15) named *Batrachomatus,* based on his *B. wingi* from Australia. Sharp (1882:600) described *Matus daemeli* from Australia, and somewhat hesitantly placed *Batrachomatus* in synonymy. In 1919, Zimmermann (pp. 197, 215) recognized both genera and proposed the tribe Matini for them. Although I have seen neither *wingi* nor *daemeli,* I have before me two undescribed Australian species and consider *Batrachomatus* to be valid. The present paper deals with the species of *Matus,* which can be separated from *Batrachomatus* by the epipleura which are narrowed abruptly adjacent to the first apparent abdominal segment instead of being very gradually narrowed from base to apex.

A critical study of material comprising the *Matus bicarinatus* (Say) of collections, shows that it is composite. Say (1823:98) did not give a type locality for his species, and since his description is not very detailed, it has been difficult to decide which of the two species now known is the true *bicarinatus.* I had hoped that there might be an example of *bicarinatus* passed upon by Say in the Harris Collection at the Museum of the Boston Society of Natural History. Dr. Dow has been so kind as to examine Harris' three specimens; none of them bears a red "u", which would indicate an examination and return by Say, and according to Harris' manuscript cataolgue, his first specimen was not taken until 1828.

Say described the body as "oblong-oval", and the elytra as "attenuated behind". Of the two species at hand, one is always oblong-oval, with the elytra attenuated behind; the other is more variable, but typically it is oval, rarely if ever attenuated posteriorly. Accordingly the former is here recognized as *bicarinatus,* and the latter is described as new (see figures 6 and 8). The diagrammatic drawing of a paramere of *bicarinatus* given by Zimmermann (1919:195, fig. 4) is of the species so recognized here; but the illustration of the beetle in Sharp (1882, fig. 192) and that of Dimmock (1884:392, fig. 469) are apparently the *M. ovatus* of this paper. The two species must have been confused in Aubé's series; when erecting the genus *Matus* for *bicarinatus,* he says in the generic synopsis, "Corps ovalaire" and "Elytres ovalaires" while in the more detailed specific description he writes "Elongato-ovalis, convexus, postice attenuatus,....",

*Contribution No. 2043, Division of Entomology, Science Service, Department of Agriculture, Ottawa.

†This is the original description of *Matus.* The reference given by various American authors, to Aubé, 1838:390, is to a redescription.

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"Corps ovale, très-allongé, atténué en arrière et très-convexe" and "Elytres ovalaires, très-allongées, atténuées en arriére, et très-convexes;....." The *bicarinatus* of the present article has decidedly convex elytra, *ovatus* has not; yet the figure to which Aubé refers us (plate 23, fig. 3), is surely my *M. ovatus*.

KEY TO THE SPECIES AND SUBSPECIES.

1. Form elongate-oval, attenuated behind (fig. 8); metacoxal plates polished, not microreticulate though sparsely punctate; male genitalia as in figures 3, 4, and 5. General distribution along a line drawn from Massachusetts to Texas ..... *bicarinatus* Say.
   Form more evenly ovate, usually not attenuated behind, or if so, sides subparallel (fig. 6); metacoxal plates microreticulate (warning: harder to see in teneral specimens), and punctate; male genitalia as in figures 1, 2 and 7. General distribution from Ontario to Florida and west to Illinois ..... 2.
2. Larger (average length 8.5 mm.), general color brownish-red, the elytra slightly darker; anterior pronotal angles acute except in small specimens; metacoxal plates more coarsely and closely punctate ..... *ovatus ovatus* n. sp.
   Smaller (average length 8 mm.), general color piceous, the elytra often much darker; anterior pronotal angles rounded; metacoxal plates usually very finely and sparsely punctate. Known from Florida and Georgia ..... *ovatus blatchleyi* n. subsp.

Matus bicarinatus (Say)

C. [*olymbetes*] *bicarinatus* Say, 1823, Trans. Am. Philos. Soc., *2* (N.S.):98.

Male. Length 8.7 mm., width 3.9 mm. Body elongate-oval, attenuated posteriorly (fig. 8), slightly gibbous at the middle in profile; dorsal surface very finely alutaceous, shining. General color brownish-red both dorsally and ventrally, the antennae, palpi, legs and epipleura paler. Head paler than pronotum, narrowly piceous along subgenal sutures, the ventral antennal sockets showing dorsally as a round spot in front of each eye; anterior and posterior margins of pronotum vaguely piceous; disk of elytra a little darker than the pronotum; elytral tracheae visible through the clear integument.

Head broad, two-thirds as wide as base of pronotum, surface microreticulate and punctate, the labrum less strongly so, meshes small and equal; with a series of contiguous punctures forming an interrupted groove near edge of clypeus on each side of the median anterior emargination, an impressed line of punctures extending from the inner margin of each antennal socket to tentorial pits, bifid at inner ends.

Pronotum slightly more than two-fifths as long as broad, widest at base; anterior angles rounded, posterior angles subrectangular. Sides evenly arcuate, the marginal bead well defined, extending from anterior to posterior angles and about as wide as a terminal antennal segment. Microsculpture more strongly impressed laterally than on disc; punctation finer and sparser than that on head.

Elytral reticulation with meshes a little coarser but more lightly impressed than that of head or pronotum, while the punctation is finer and sparser, especially on disc. Three longitudinal series of punctures on each elytron: one discal and impressed, one just before the humerus and faint, one subhumeral and very faint.

Prosternum with a deep longitudinal median sulcus extending to the tip of the prosternal process, the groove slightly constricted between the coxae; sides of process almost parallel, narrowly margined, converging apically to the acute, but not acuminate, tip. First three segments of pro- and mesotarsi clothed

ventrally with a pad of flat-tipped hairs; first segment very slightly broader (dorsal view) than second; anterior (inner) protarsal claws bent downward a little above the base and twice as wide as their fellows. Metacoxal plates polished, not microreticulate, though sparsely punctate. Abdominal sternites finely, sparsely punctate; very finely reticulate, especially apically.

Male genitalia. Aedeagus, figures 3, 4; parameres, figure 5.

Females. Similar except that the pro- and mesotarsi are not dilated nor clothed beneath with pads of hairs.

Neotype. Since Say's types are considered lost, I here designate as neotype of *Colymbetes bicarinatus* Say the male described above; it is labelled: W. Peabody, Mass., August, 1921. (Percy Gardiner Bolster Collection), Type No. 25,256 in the Museum of Comparative Zoology, Cambridge, Mass.

Distribution. I have sixty-seven specimens before me from the following localities: NEW JERSEY: Rivervale; NEW YORK: Huguenot, Peekskill; CONNECTICUT: (no locality specified); MASSACHUSETTS: Billerica, Cambridge, Concord River, West Peabody, Framingham (Beaver Dam Brook), Saugus; N. Attleboro; MICHIGAN: Palmer Park; MISSISSIPPI: Leakesville, Lucedale; LOUISIANA: Sabino River Ferry opposite Orange, Tallulah; TEXAS: Dallas Co.

Variation. The slight dorsal gibbosity (profile) is not always apparent. Some beetles, especially those from Mississippi and Louisiana, have the anterior pronotal angles rather sharp, more as in typical *ovatus*, and the majority of these specimens have the elytra unusually strongly attenuate posteriorly. *M. bicarinatus* does not vary much in size; the smallest one seen is 8 mm. long, the largest 8.75 mm. There are some differences in color, a few specimens being uniformly yellowish-brown; these beetles are probably teneral. Aubé remarked on similar color variation in his material.

Life history. Unknown, or at least has not been published upon. Teneral adults at hand were collected in June (Mississippi, Louisiana), July (Michigan, Louisiana), and September (Massachusetts).

Matus ovatus n. sp.

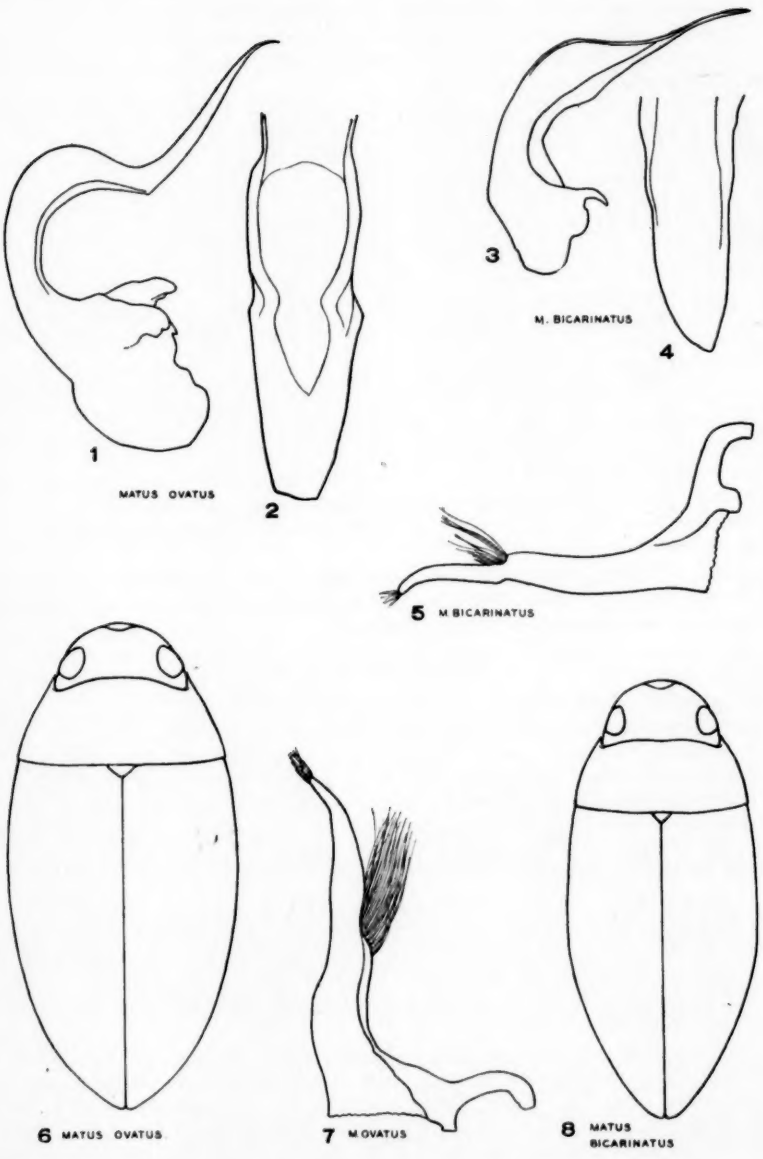
Male. Length 9.3 mm., width 4.3 mm. Body evenly oval, not attenuated apically (fig. 6), not gibbous in profile; dorsal surface finely alutaceous, moderately shining. General color brownish-red both dorsally and ventrally, the antennae, palpi, legs and epipleura a little lighter; head paler than pronotum, narrowly piceous along subgenal sutures, the ventral antennal sockets showing dorsally as a round spot in front of each eye; anterior and posterior margins and disk of pronotum tinged with piceous; elytra, especially posteriorly, slightly darker than pronotum.

Head broad, almost seven-tenths as wide as base of pronotum, surface microreticulate and punctate, the labrum less strongly so, meshes small and equal; with a series of contiguous punctures forming an interrupted groove near edge of clypeus on each side of the median anterior emargination, and an impressed line of punctures extending from inner margin of each antennal socket to tentorial pits, bifid at inner ends.

Pronotum two-thirds as long as broad, widest at base, with a shallow longitudinally impressed area near each basal angle; anterior angles acute, posterior angles subrectangular. Sides evenly arcuate, the maringal bead well defined, extending from anterior to posterior angles and about as wide as a terminal antennal segment. Microsculpture weakly impressed on disc, but clearly defined in front of anterior transverse line of punctures; punctation finer and sparser than that of head.

Elytral microreticulation more evident than that of head or pronotum, most strongly impressed dorsally and apically, least obvious laterally. Puncta-

PLATE VI.



THE SPECIES OF *MATUS*

tion a little finer and denser than that of the pronotum, with the exception of three longitudinal series of bigger punctures on each elytron: one discal and impressed, one just before the humerus and faint, one subhumeral and very faint.

Prosternum with a deep longitudinal median sulcus extending to tip of prosternal process, the groove slightly narrowed between the coxae; sides of process almost parallel, narrowly margined, converging apically to the acute, but not acuminate, tip. First three segments of pro- and mesotarsi clothed ventrally with a pad of flat-tipped hairs; first segment broader but less than twice as broad (dorsal view) as following segments; anterior (inner) protarsal claws more sharply bent at base and twice as broad as their fellows. Claws of metalegs unequal, the outer ones narrower and only half as long as the inner. Metacoxal plates and last abdominal sternite microreticulate and punctate, the punctures of about the same size as those on the head; metasternum and the remaining abdominal sternites less evidently reticulate, more finely and sparsely punctate.

Male genitalia. Aedeagus, figures 1, 2; parameres, figures 7.

Female. Similar, except that the pro- and mesotarsi are not dilated nor clothed beneath with pads of hairs.

Holotype. ♂, Lexington, Mass., May 1, 1926 (Darlington; John George Gehring Collection). No. 25,257 in the Museum of Comparative Zoology, Harvard College, Cambridge, Mass.

Allotype. ♀, swamp, Lexington, Mass., May 1, 1926 (Darlington; P. J. Darlington Collection). In the Museum of Comparative Zoology.

Paratypes. ONTARIO: 1 ♂ Pr[ince] Edw[ard] Co., August 22, 1923 (Brimley); 2 ♀ Pr. Edw. Co., August 22, 1932 (Brimley). QUEBEC: 1 ♀, Hemmingford, (Petch); 1 ♀, Montreal, April 25, 1935 (Fr. Hugues); 4 ♀, Montreal, September 2, 1934 (J. I. Beaulne). MICHIGAN: 1 ♀, Detroit, July 23, 1910 (A. W. Andrews). NEW YORK: 1 ♂, Huguenot, Staten Is., December 17, 1939 (L. Faas); 1 ♀ Malden Bridge, May 30, 1928 (Chamberlain); Peekskill, 1 ♀, April 21, 1897, 1 ♀, May 29, 1890, 1 ♀, July 21, 1891 (Sherman); 1 ♂, 1 ♀, "N. Y." only. MASSACHUSETTS: Arlington, 1 ♂, October 25, 1924, 1 ♀, October, 1924, 1 ♂, May 23, 1925 (P. J. Darlington); 2 ♂, Fresh Pond, Cambridge, November 2 (P. J. Darlington) 1 ♂, Cambr[idge], (Uhl.); 3 ♂, 2 ♀, Drac[ut]; Framingham, 2 ♀, October 21, 1907 (C. A. Frost), 1 ♀, October 22, 1916 (C. A. Frost; sifting moss); 1 ♂, Low[ell]; 1 ♀, N. Attleboro, October 3, 1920 (Frost); 1 ♀, Saugus, Essex Co., August; 1 ♂, 1 ♀, Southboro, April 20, 1939 (J. G. Thorndike); Stoneham, 1 ♂, March 16, 1913, 1 ♀, July 12, 1916 (F. W. Dodge); 2 ♂, Swampscott, Essex Co. (F. W. Dodge); 1 ♂, Wayland, March 13, 1925, (P. J. Darlington); 3 ♂, 5 ♀, "Mass" only. RHODE ISLAND: 1 ♀, Providence, November 20, 1896 (Crew). PENNSYLVANIA: 1 ♀, Harrisburg, July 11, 1939 (A. B. Champlain). NEW JERSEY: 1 ♂, Palisades, May 20, 1936; 1 ♂, Rivervale, May 25, 1930 (P. J. Darlington); 1 ♀, "N. J." only. MARYLAND: Edgewood, 1 ♂, August 24, 1918, 1 ♀, September 17, 1918 (H. Dietrich). ILLINOIS: 2 ♂, 1 ♀, Beach, Lake Co., April 28, 1932 (B. Benesh); 1 ♀, Algonquin, July, 1910 (Nason).

In addition, specimens (not paratypes) have been seen from the following localities: Indiana (all teneral); Mobile, Alabama.

Paratypes will be distributed as follows: Museum of Comparative Zoology, 22; Canadian National Collection, 5; Cornell University, 4; University of Illinois, 1; British Museum, 2; J. B. Wallis, Winnipeg, Man., 8; F. N. Young, Gainesville, Fla., 2; C. A. Frost, Framingham, Mass., R. Hopping, Vernon, B. C., 3; my own collection, 12.

Variation. The paratypes vary in length from 7.5 to 9.4 mm., the majority being between 8.75 and 9 mm. The width is also somewhat variable, and in a few specimens the elytra are vaguely attenuated. In typical examples the

anterior pronotal angles are sharp, though not acuminate; in some of the paratypes the angles are blunter, while in others they are fully as rounded as in typical *bicarinatus;* these differences are not correlated with distribution. The punctation of the metacoxal plates is variable as to size and density of the punctures.

Life history. Unknown. Teneral adults (lighter in color than fully matured specimens) have been taken in April (Massachusetts) and August (Ontario).

Matus ovatus blatchleyi n. subsp.

In 1919, Blatchley drew attention to a specimen of *Matus* from Jerry Lake, Dunedin, Fla.; the beetle was only 7.3 mm. long and had the elytra a uniform shining piceous, as compared with Indiana examples of 8.5 to 9 mm. in length and of a uniform brownish-red color. Excepting tenerals, all Florida and Georgia specimens which I have seen are much darker than those from further north. They average only 8 mm. in length, tend to be subparallel and slightly attenuated behind, and have the anterior pronotal angles rounded, thus simulating *bicarinatus.* However, their true affinity is shown by the reticulate metacoxal plates and the male genitalia, in both of which they agree with *ovatus.*

Description: ♂, length 8 mm.; width 3.8 mm. Similar to *M. ovatus mihi* (q. v.) except as follows: Surface more shining, the reticulations not so deeply impressed; anterior pronotal angles rounded; head and pronotum tinged with piceous, elytra piceous except at sides near base, ventral surface brownish-red, abdominal sternites piceous except the first and second medially; metasternal plates more finely punctate.

Holotype. ♂, Brighton, Fla., Okeechobee, June 16, 1929 (Darlington, P. J. Darlington Collection). No. 25,258 in The Museum of Comparative Zoology, Cambridge, Mass.

Allotype. ♀, same data as holotype.

Paratypes. 6 ♀, same data as holotype; 1 ♀, Pinecrest, Collier Co., Fla., June 19, 1929; 2 ♂, Sanford, Fla.; 1 ♂, 1 ♀, Gainesville, Fla., April 15, 1933 (Sadler); 1 ♂, 1 ♀, Alachua Co., Fla., April 22, 1937 (F. Young) and 1 ♂, October 11, 1937; 2 ♂, 3 ♀, Flagler Co., Fla., April 1, 1937 (H. H. Hobbs); 1 ♂, 1 ♀, Leon Co., Fla., June 5, 1938 (F. Young); 12 ♂, 7 ♀, Clinch Co., Ga.,* October 27, 1938 (F. N. Young); 1 ♀, Chickasaw, Ala., June 25, 1931 (H. Dietrich) (teneral).

Paratypes will be distributed as follows: Museum of Comparative Zoology, 2; Canadian National Collection, 2; Cornell University, 1; British Museum, 2; F. N. Young, 28; J. B. Wallis, 2; C. A. Frost, 1; my own collection, 3.

Variation. The paratypes vary in length from 7 to 8.5 mm. Both the smallest and the largest specimens are from Florida; the examples from Georgia are almost all parallel-sided and small. The single teneral female paratype from Alabama is quite typical of the subspecies *blatchleyi,* but a male and two females from Mobile, Ala., are somewhat intermediate between that and *ovatus* and have not been designated paratypes with either series. Further material from Alabama and the Carolinas may delimit the range of the subspecies. A small variation has been noted in the shape of the anterior pronotal angles and in the punctation of the metasternal plates.

In addition, I have seen two teneral specimens (not paratypes) from St. Johns Co., Fla., April 23, 1938 (F. Young), and other tenerals from Clench Co., Ga., and Alachua Co., and Miami, Fla.

Acknowledgments. I am most grateful to the following persons who have

*I have been informed by Mr. Young that these specimens were taken 7.6 miles north of Fargo on Georgia Highway 89.

generously loaned specimens from either their own collections or those in their charges: Drs. P. J. Darlington, Jr., J. C. Bradley, H. Dietrich, W. V. Balduf, and Messrs. F. N. Young, W. J. Brown, J. B. Wallis, C. A. Frost, R. Hopping, L. Faas. In addition, Dr. R. Dow and Mr. F. N. Young have given helpful notes.

REFERENCES

Aubé, C. 1836. Hydrocanthares *in*: Dejean's Iconographie et histoire naturelle des Coléoptères d'Europe. Vol. 5. Paris (*Matus*, pp. 189-191).

1838. Species général des Hydrocanthares et Gyriniens *in*: Species général des Coléoptères de la collection de M. le Comte Dejean. Vol. 6. Paris. (*Matus*, pp. 390-392).

Blatchley, W. S. 1919. Insects of Florida. Supplementary notes on the water beetles. Bul. American Mus. Nat. Hist., *41* (Art. 4): 305-322. (*Matus*, p. 313).

1923. Notes on the Coleoptera of southern Florida with descriptions of new species. Canadian Ent. *55* (1): 13-20 *Matus*, p. 16).

Clark, H. 1866. Catalogue of the Dytiscidae and Gyrinidae of Australsia, with descriptions of new species. Jour. Entomology (London), *2*, (Description of *Batrachomatus* (Schaum and White MS.) Clark, p. 15).

Dimmock, G. 1884. The beetles *in*: The Standard Natural History. Ed. by J. S. Kingsley. S. E. Cassino and Co., Boston. Vol. 2, Crustacea and Insects. (*Matus*, p. 392, fig. 469).

Leng, C. W. and A. J. Mutchler. 1918. Insects of Florida. The water beetles. Bul. American Mus. Nat. Hist.. *38* (Art. 3): 73-116. (*Matus*, p. 88.)

Say, T. 1823. Descriptions of insects of the families Carabici and Hydrocanthari of Latreille, inhabiting North America. Trans. American Phil. Soc., *2* (N. S.): 1-109. (*Colymbetes bicarinatus*, p. 98).

Sharp, D. 1882. On aquatic carnivorous Coleoptera or Dytiscidae. Sci. Trans. Roy. Dublin Soc., (2) *2*:179-1003, plates 7-18. (*Matus*, p. 599).

Zimmermann, A. 1919. Die Schwimmkäfer des Deutschen Entomologischen Museums in Berlin-Dahlem. Arch. f. Naturgeschichte (for 1917), *83* (A.12): 68-249, 21 text figs., 3 plates. (*Matus*, p. 215).

EXPLANATION OF PLATE VI.

Fig. 1. *Matus ovatus* n. sp. Medign lobe of male genitalia, profile.
Fig. 2. *M. ovatus*. Upper two-thirds of Fig. 1, viewed from above.
Fig. 3. *Matus bicarinatus* (Say). Median lobe of male genitalia, profile.
Fig. 4. *M. bicarinatus*. Upper two-thirds of Fig. 3, viewed from above.
Fig. 5. *M. bicarinatus*. Lateral lobe (paramere) of male genitalia.
Figures 1, 2, 3, 4, 5, and 7 are drawn to the same scale.
Fig. 6. *Matus ovatus*. Outline.
Fig. 7. *M. ovatus*. Lateral lobe (paramere) of male genitalia.
Fig. 8. *M. bicarinatus*. Outline.
Figures 6 and 8 are drawn to the same scale.

A NEW SPECIES OF *MIRAX* PARASITIC ON *COPTODISCA ARBUTIELLA* BSK. (HYMENOPTERA, BRACONIDAE) *

BY G. STUART WALLEY,
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In rearing the lepidopterous leaf miner *Coptodisca arbutiella* Bsk. from the leaves of the Madrona (*Arbutus menziesii* Pursh.) at Vancouver, B. C., Mr. W. G. Mathers and Professor G. Spencer obtained specimens of a Braconid parasite which on examination proved to be an undescribed species of the genus *Mirax*. The species in question is very similar to *Mirax ectodemiae* (Roh.) and examples were submitted to Dr. C. F. W. Muesebeck who has kindly compared them with *ectodemiae* and has supplied additional data concerning that species.

*Contribution No. 2086, Division of Entomology, Science Service, Department of Agriculture, Ottawa, Canada.

Mirax coptodiscae n. sp.

Differs from *ectodemiae* (Roh.) in having the mesoscutum subopaque, with very shallow indistinct punctures, scutellum with only a slight trace of a sulcus at base, legs (in female) light brownish with the base of coxae, more or less of trochanters, base of femora, middle and hind tibiae except narrow base, and all tarsi dark brown (the male with coxae, trochanters and femora often uniformly light brownish). In *ectodemiae* the mesoscutum is shining, with shallow but distinct punctures, the scutellum has the basal sulcus better defined, and the legs including the tibiae are yellow.

Female. Length 1.6 mm. Head about as wide as thorax, not quite smooth but with an indistinct minute type of sculpture which imparts a characteristic luster; vertex and temple with a few large, shallow, poorly defined punctures; temple rounded; malar space equal to basal width of mandible; vertex without a median longitudinal groove; antenna about as long as body, first flagellar segment noticeably longer than second. Pronotum, pleura and mesosternum polished, impunctate; mesoscutum only feebly shining, with numerous but very indefinite shallow punctures; notaulices faintly impressed on anterior third of mesoscutum; scutellum smooth; propodeum shining, with a complete median longitudinal carina and a few transverse rugae on either side behind, the latter somewhat curving forward in region of median carina and with their outer ends joining the sharply carinate lateral margin of propodeum; first abscissa of cubitus obliterated at base; portion of discoideus between basal vein and nervulus thickened; nervulus oblique. Sclerotized plate of first abdominal tergite very narrow at base, broadened in apical half; plate of second tergite extremely narrow at base, strongly widening near apex; most of first two tergites finely evenly striate and membranaceous as is also a considerable portion of the third tergite; ovipositor sheath slightly shorter than posterior metatarsus.

Black; antenna with basal three or four segments more or less brownish; palpi brown; tegulae yellowish-brown; stigma dark brown, pale at apex; entire first two abdominal tergites and more or less of third tergite and venter of abdomen at base pale yellowish; remainder of abdomen dark brownish-black.

Male. Similar to female in most respects. The antenna is a little more slender than in the female, with its basal segments somewhat paler, and the coxae, trochanters and femora are frequently less distinctly marked with dark brown.

Holotype—♀, Vancouver, B. C., June 19, 1939, (G. Spencer). No. 5200 in Canadian National Collection, Ottawa, Ont.

Allotype—♂, Vancouver, B. C., June 9, 1939 (G. Spencer).

Paratypes—22 ♂♂, 20 ♀♀, Vancouver, B. C. (W. G. Mathers and G. Spencer), reared on the following dates: July 8, 12, 1935 (Mathers); June 1, 2, 22, 29, 1936 (Mathers); June 9, 12, 19, 21, 26, 1939 (Spencer); also ♂, 2 ♀♀, from same locality, May 26, 1940 (submitted by the Dominion Parasite Laboratory, Belleville, Ont.).

Paratypes are being deposited in the United States National Museum and in the British Museum of Natural History.

Host—All specimens mentioned above were reared from *Coptodisca arbutiella* Bsk.

NEW NEARCTIC CRANE-FLIES (TIPULIDAE, DIPTERA). PART XV.

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The preceding part under this general title was published in 1940 (Can. Ent., 72:151-155). The new species described at this time were collected by Messrs. A. E. Brower, R. E. Nye, G. F. Knowlton and H. D. Pratt, and by Dr. Marion E. Smith. I am very greatly indebted to all of the above for the privilege of retaining the type specimens in my extensive collection of these flies.

Tipula (Yamatotipula) continentalis n. sp.

Allied to *tephrocephala;* general coloration dark gray, the praescutum with narrow blackened borders to the stripes, the median one especially distinct though narrow; antennae relatively short, scape and pedicel yellow, flagellum black; flagellar segments with scarcely developed basal enlargements, verticils short; wings weakly infuscated, with a very poorly differentiated darker pattern, most evident in the outer radial field and at the outer end of cell 1*st* M_2; male hypopygium with the tergite produced into two narrow lobes that are separated by a slightly wider U-shaped notch; outer dististyle pale, oval in outline.

Male. Length about 11 mm.; wing 12.5 mm.

Frontal prolongation of head relatively long, subequal in length to the remainder of head, dark brown above, slightly brightened on ventral half; nasus elongate; palpi black. Antennae with scape light yellow, pedicel a trifle darker, flagellum black throughout; flagellar segments relatively short, with scarcely developed basal enlargements, the verticils shorter than the segments. Head dark brownish gray, the front and very narrow orbits light gray; vertical tubercle relatively low and inconspicuous; anterior vertex wide. .

Pronotal scutum brown, the scutellum light yellow. Mesonotal praescutum chiefly covered by four dark gray stripes that are not or scarcely differentiated from the interspaces except by narrow, more blackened borders, the black median vitta of the intermediate stripes single for its entire length and forming a relatively conspicuous line that becomes obsolete far before the suture; dark borders of remainder of praescutum much less conspicuous; humeral region only restrictedly brightened; posterior sclerites of notum brown or black, sparsely pruinose, the parascutella a little paler; mediotergite with a central black vitta, most distinct on cephalic half of sclerite, narrowed to a capillary line behind. Pleura blackened, pruinose; dorsopleural membrane pale. Halteres with stem obscure yellow, knob infuscated. Legs with the coxae pruinose, the tips paling to yellow; trochanters obscure yellow; femora yellow basally, passing into brown at tips; tibiae and basitarsi dark brown, their tips darker; remainder of tarsi black. Wings weakly infuscated, with a very poorly differentiated darker pattern, appearing chiefly as slightly darker brown clouds in outer radial field; across outer end of cell 1*st* M_2 and the petiole of cell M_1; and less evidently as a dusky seam along vein *Cu; m-cu* not or scarcely bordered by darker; stigma oval, darker brown; brightened prestigmal and poststigmal areas; an obliterative streak crossing cell 1*st* M_2 from the outer end of cell *R* into the base of M_3; extreme base of wing narrowly more yellow; veins brown, those at extreme base yellow. Venation: *Rs* exceeding twice the length of *m-cu;* basal section of $M_3 + _4$ relatively long, nearly equal to basal section of $M_1 + _2$; cell 1*st* M_2 relatively short-hexagonal, the second section of $M_3 + _4$ very short.

Abdominal tergites dark brown, the caudal borders narrowly pale; basal tergites more reddish brown, especially laterally; sternites obsure yellow to brownish yellow; hypopygium dark. Male hypopygium with the tergite produced into two narrow lobes that are separated by a deep U-shaped notch, the lobes narrower than the notch, provided with numerous spinulose points. Dististyles

relatively simple, the outer a pale spatulate blade with relatively short setae. Gonapophyses appearing as pale spatulate blades, the stems short. Eighth sternite with its apical membrane bearing a pale depressed median lobe or blade.

Habitat. Colorado (Rocky Mountain National Park).

Holotype. ♂, at margin of small alpine ponds, along Fall River Road, below the Fall River Pass, near the Continental Divide, July 14, 1940 (Marion E. Smith). Associated with and somewhat resembling superficially *Prionocera oslari* (Dietz).

In the structure of the male hypopygium, *Tipula* (*Yamatotipula*) *continentalis* is closest to *T.* (*Y.*) *albocaudata* Doane, *T.* (*Y.*) *cayuga* Alexander, and *T.* (*Y.*) *tephrocephala* Loew. In general appearance and coloration it is very different from all these species, more generally resembling certain arctic and alpine species of the genus *Prionocera* Loew.

Limonia (Dicranomyia) piscataquis n. sp.

General coloration gray, the praescutum with a single, dark brown, median stripe: antennae black throughout; thoracic pleura pale, the mesepisternum more darkened; halteres elongate; wings subhyaline, the stigma only vaguely differentiated from the ground; Sc_1 very long, approximately one-half longer than *Rs;* male hypopygium with the ventromesal lobe of basistyle complex; rostral prolongation of ventral dististyle a long sinuous arm, beyond midlength bearing two unusually long and strong spines; gonapophyses with mesal-apical lobe slender, blackened, the lateral margins with microscopic roughenings or spinulae; aedeagus narrow and blackened.

Male. Length about 6.5 mm.; wing 7 mm.

Rostrum brown; palpi brownish black. Antennae black. Head gray; anterior vertex of moderate width, a little less than twice the diameter of scape.

Pronotum dark brownish gray. Mesonotum brownish gray, the praescutum with a conspicuous, dark brown, median stripe, the usual lateral stripes lacking; scutal lobes darkened in central portion; posterior sclerites heavily gray pruinose. Pleura and pleurotergite chiefly pale, sparsely pruinose, the mesepisternum more blackened but still heavily pruinose. Halteres elongate, dark brown, the base of stem yellow. Legs with the coxae yellow, the fore pair a trifle darker; trochanters yellow; femora yellow basally, passing into brown; tibiae dark brown; tarsi black. Wings subhyaline, the base a trifle more yellow; stigma only vaguely differentiated from the ground; veins brown, yellow in the prearcular field. Venation: Sc_1 ending opposite origin of *Rs*, Sc_2 very far from its tip, Sc_1 alone being approximately one and one-half times the length of *Rs; m-cu* a short distance before fork of *M*.

Abdomen black, sparsely pruinose; hypopygium paler, yellowish brown. Male hypopygium with the tergite transverse, the caudal margin truncate. Basistyle with the ventromesal lobe complex, consisting of two major portions, the more caudal a blackened lobe that bears a slightly smaller lateral branch at its apex, the main axis at tip being provided with many very long setae; the more cephalic lobe more or less bilobulate, pale in color, the longer lobule somewhat pointed, bearing long conspicuous setae. Dorsal dististyle a blackened, gently curved rod that narrows very gradually to a long acute point. Ventral dististyle with the main body relatively small, subequal to the corresponding portion of basistyle, yellow; rostral prolongation of unusual length, appearing as a slender sinuous arm, just beyond midlength on outer face bearing two unusually long and powerful spines that are directed slightly outward; spines placed in a linear row, their basal enlargements contiguous; apex of prolonga-

tion with a few long conspicuous setae. Gonapophyses with mesalapical lobes long and slender, blackened, the lateral margin with microscopic roughenings or spinulae. Aedeagus unusually narrow and blackened.

Habitat. Maine (Piscataquis County).

Holotype. ♂, Sourdnahunk Lake, October 12, 1940 (A. E. Brower).

Limonia (*Dicranomyia*) *piscataquis* is so distinct from all other described Holarctic members of the subgenus that comparison with other species seems scarcely necessary. It is perhaps most closely related to *L.* (*D.*) *cramptoniana* Alexander and *L.* (*D.*) *sphagnicola* (Alexander) but differs from these and other species in virtually every detail of structure of the male hypopygium.

Limonia (Rhipidia) gaspicola n. sp.

Size large (wing, female, 9 mm.); general coloration gray, the praescutum with three brownish black stripes, the broad median one split by a capillary median vitta on its anterior third; lateral praescutal stripes narrow but distinct; pectinations of flagellar segments (female) long and conspicuous; femora yellow, with a conspicuous subterminal blackened ring, broadest and most nearly apical on the fore legs; wings with the dark spotted pattern brownish gray, sparse and well-delimited; cell 1*st* M_2 relatively short.

Female. Length about 9 mm.; wing 9 mm.; antenna about 2 mm.

Rostrum and palpi black. Antennae black, the apical pedicels of the flagellar segments whitened; flagellar segments strongly produced, much more so than in the corresponding sex of *maculata*, on the intermediate segments being about as long as the basal swelling and considerably exceeding in length the apical pedicel; terminal segment one-half longer than the penultimate. Head brownish gray; anterior vertex clearer gray, reduced to a narrow line.

Pronotum gray, infuscated medially. Mesonotal praescutum light gray with three brownish black stripes, the median one broad and almost entire, on its cephalic third split by a capillary pale median vitta; lateral stripes very narrow and inconspicuous, their cephalic ends directed mesad toward the central stripe; scutal extensively brownish black, the median area gray; scutellum and postnotum heavily pruinose. Pleura gray, indistinctly lined longitudinally with blackish, the more conspicuous stripe dorsal, extending from the ventral propleura across the anepisternum to the pteropleurite, the ventral stripe crossing the sternopleurite at mid-height; meral region more blackened. Halteres whitened. Legs with the coxae dark brown, pruinose, the tips paling to yellow; trochanters yellow; femora yellow basally, before the tips with a conspicuous blackened ring, broadest and nearly terminal in position on the fore legs, narrower and placed about its own length from the tip on the hind legs; tibiae obscure yellow, the tips narrowly blackened; basal three tarsal segments obscure yellow, the tip of the third and both succeeding segments black. Wings with the ground color pale yellow, sparsely but distinctly spotted with brown and brownish gray areas that are more clearly delimited than in *maculata;* major dark areas four, costal in position, the third a common one involving both the origin of *Rs* and the fork of *Sc;* fourth area stigmal, broken by pale spots; cord and outer end of cell 1*st* M_2 narrowly seamed with brown; elsewhere on disk the cells with sparse, scattered, brownish gray spots that are well-defined and not confluent; veins yellow, dark brown in the patterned areas. Venation: *Sc* relatively short, Sc_1 ending about opposite one-third the length of *Rs*, Sc_2 at its tip; free tip of Sc_2 and R_2 in transverse alignment; cell 1*st* M_2 relatively small, subequal to or a little longer than vein M_3 beyond it; *m-cu* at or close to fork of *M*.

Abdomen brownish black, the genital segment more reddish brown.

Habitat. Quebec (Gaspé).

Holotype. ♀, Matapedia, July 17, 1940 (A. E. Brower).

Limonia (*Rhipidia*) *gaspicola* is very different in its general appearance from *L.* (*R.*) *maculata* (Meigen) which unquestionably seems to be its nearest ally. The chief distinguishing characters are in the large size of the present fly which is equal to *L.* (*R.*) *bryanti* (Johnston), the strongly produced flagellar segments in the female, the mesonotal pattern, distinctly blackened rings on femora, and the sparse but very distinct wing-pattern. Superficially, the fly much resembles *Limonia* (*Limonia*) *pemetica* Alexander, actually a very different fly.

Pedicia (Tricyphona) smithae n. sp.

Belongs to the *ampla* group; general coloration of thorax black, the praescutum with the yellow ground restricted to very narrow posterior interspaces and humeral triangles; scutum and scutellum dark; wings yellowish brown, the stigma a little darker; cell R_3 short-petiolate; cell 1*st* M_2 closed; male hypopygium with the tergite produced medially into a very broad, dark-colored lobe, its margin truncate or virtually so, the lateral angles obtusely rounded; dististyle five-spined.

Male. Length about 11 mm.; wing 12 mm.; antenna about 1.5 mm.

Rostrum black, sparsely pruinose; palpi black. Antennae relatively short, black; flagellar segments oval; outer segments decreasing in size. Head black, sparsely pruinose.

Pronotum black, sparsely pruinose. Mesonotal praescutum with the restricted ground color obscure yellow, almost covered by three blackish gray stripes, the posterior interspaces limited to capillary pale lines; lateral stripes expanded to the outer margin of praescutum, restricting the ground color to yellow humeral triangles; scutum dull black, including the median area, restrictedly pale at central portion of suture and again on outer posterior portions of scutal lobes; scutellum black, parascutella brownish yellow; mediotergite dark brown, bordered laterally by yellow; pleurotergite brown, the ventral and cephalic portions broadly pale. Pleura yellow, including the dorsopleural membrane and most of pteropleurite; the entire mesepisternum and meron brownish black. Halteres unusually long, stero obscure yellow, darkened outwardly, knob brown. Legs with the coxae dark brown, the tips paling to yellow, broadest on the fore pair; trochanters yellow; femora yellow, the tips narrowly and weakly infuscated, the amount subequal on all legs; tibiae yellow, the tips even more narrowly dark brown; tarsi yellow, the outer segments blackened. Wings with a yellowish brown tinge, the large oval stigma a little darker brown; veins brown. Venation: Sc_2 a short distance before origin of *Rs,* the latter elongate, arcuated to angulated at origin; R_{2+3+4} present as a short erect element, cell R_3 thus short-petiolate; basal section of R_5 in longitudinal alignment with the outer section; cell 1*st* M_2 closed; cell M_1 with petiole longer than *m*. The left wing of the type shows an adventitious crossvein in cell R_3 at near one-third the length of cell.

Abdomen elongate; tergites dark brown, the lateral borders narrowly yellow, the posterior borders of the individual segments in the infuscated portions even darker, more brownish black; sternites dark brown, sparsely pruinose; hypopygium brownish black. Male hypopygium with the median area of tergite broadly produced, darkened like the remainder of sclerite, the caudal margin truncate to very feebly emarginate, the lateral angles broadly and obtusely rounded. Dististyle short-based, at apex and on face produced into five strong points, the most basal one very slender and spinous; outer dististyle a very small pale fleshy lobe with elongate setae.

Habitat. Washington.

Holotype. ♂, Mount Rainier, Tipsoo Lake near Chinook Pass, altitude about 5,000 feet, August 2, 1940 (M. E. Smith).

I take great pleasure in naming this species after Dr. Marion E. Smith, Curator of the Insect Collection of the Massachusetts State College, to whom I am indebted for many rare Tipulidae. The nearest ally is the large and conspicuous *Pedicia* (*Tricyphona*) *ampla* (Doane) which differs in the size, coloration of the antennae and body, the yellow-tinted wings, and in the structure of of the male hypopygium, as the long-produced pale median lobe of the tergite, the apex of which is conspicuously emarginate. Both species, as well as the Eastern Nearctic *P.* (*T.*) *autumnalis* (Alexander) and *P.* (*T.*) *huffae* Alexander, have the five-spined dististyle that characterizes the group.

Dicranota (Dicranota) fumipennis n. sp.

General coloration dark brownish gray, the praescutum with three entire dark brown stripes; antennae black throughout, short, the flagellar segments short-oval; wings with a strong dusky tinge, the costal region, stigma and a seam along vein *Cu* still darker; male hypopygium with the inner dististyle expanded at outer end, the apex broadly obtuse; interbasal rod with apex slightly cultriform.

Male. Length about 5.5 mm.; wing 6–6.2 mm.; antenna about 1.1 mm.

Female. Length about 6.5–7 mm.; wing 7–7.3 mm.

Rostrum short,, brownish gray; palpi black. Antennae short, black throughout; flagellar segments short-oval, the verticils short and stout; terminal segment small. Head brown, the front and orbits more grayish.

Pronotum brownish gray. Mesonotal praescutum brownish gray with three conspicuous dark brown stripes, the median one entire; posterior sclerites of notum dark blackish gray, the pleura somewhat clearer gray. Halteres pale, the knobs weakly darkened. Legs with the coxae gray; trochanters brownish yellow; remainder of legs dark brown, the femoral bases more yellow, the tarsi passing into black. Wings with a strong dusky tinge, still darker in cells *C* and *Sc*, the stigma and along vein *Cu;* longitudinal veins beyond cord very narrowly and vaguely seamed with darker; veins brown. Venation: Cell M_1 present; *m-cu* variable in position, usually more than one-half its length beyond the fork of *M*.

Abdomen, including hypopygium, dark brownish gray, the sternites somewhat clearer gray with narrow, more reddish brown, posterior borders; in the female, the sternites are more extensively pale. Male hypopygium with the interbasal lobe straight, its apex obtusely rounded or slightly cultriform. Outer dististyle a small oval hairy lobe. Inner dististyle nearly twice as long as the outer, the distal end a little expanded, the apex broadly obtuse. Lateral arms of phallosome appearing as slender lobes with acute tips.

Habitat. Minnesota (Hennepin County).

Holotype. ♂, Nine-mile Creek, April 29, 1939 (H. D. Pratt). *Allotopotype.* ♀, pinned with type. *Paratopotypes.* 6 ♂ ♀, with the types.

The three species most nearly allied to the present fly are *Dicranota* (*Dicranota*) *currani* Alexander, *D.* (*D.*) *divaricata* Alexander, and *D.* (*D.*) *notmani* Alexander, all from eastern North America. *D. notmani* is well-distinguished from all of the others by the conspicuously elongate antennae in the male. *D. divaricata* has the interbases and the lateral arms of the phallosome unusually long and slender. *D. currani* has the median praescutal stripe weakly divided by a pale central vitta, the wings less strongly infuscated, cell *2nd A* wider, and the hypopygium with the inner dististyle narrower, not so expanded and spatulate at its outer end, and the interbase longer and more pointed at apex.

Dactylolabis knowltoni n. sp.

General coloration gray, the praescutum with three polished black stripes, the scutal lobes each with two similar polished black areas; wings with a strong yellow tinge, virtually unpatterned except for the small oval brown stigma; abdomen black, the hypopygium reddish brown; male hypopygium with the vestiture of outer face of inner dististyle sparse and weak; phallosome with the outer blades transversely oval.

Male. Length about 6–6.5 mm.; wing 7 mm.

Female. Length about 8–8.5 mm.; wing 8 mm.

Rostrum black, sparsely gray dusted; palpi black. Antennae black, the scape sparsely pruinose; flagellar segments oval, gradually decreasing in length outwardly. Head gray.

Pronotum uniformly gray. Mesonotal praescutum gray with three separate polished black stripes, the median one broader than the laterals, not reaching the suture behind; lateral stripes crossing the suture onto the scutal lobes, the latter with a further more posterior polished area at near midlength; posterior sclerites of notum heavily gray pruinose. Pleura with a heavy gray pruinosity. Halteres yellow, the small knobs not or scarcely infuscated. . Legs with the coxae darkened and pruinose basally, the tips paling to obscure yellow; trochanters yellow; femora obscure yellow, clearer basally, more obscure outwardly, the tips passing into brown; tibiae obscure yellow or brownish yellow, the extreme bases and tips more darkened; tarsi black. Wings with a strong yellow tinge, almost unpatterned except for the small oval brown stigma; cord and outer end of cell 1*st* M_2 not or scarcely seamed with darker; veins brown, those at the wing-base yellow. Costal trichia normal, short but dense, not spinose. Venation: Sc_1 ending nearly opposite or just before fork of $R_2+_3+_4$; cell M_1 subequal to its petiole; *m-cu* at or very close to fork of *M*.

Abdomen polished black; hypopygium obscure reddish brown, the dististyles black. In female, the abdominal sternites more reddish brown, darkened at the bases and subapically, the extreme caudal margins of the segments narrowly pale. Male hypopygium with the outer dististyle cylindrical, thickened at base, thence of nearly equal diameter to the obtuse tips; inner dististyle only a little more than one-third as long, slender, the vestiture sparse and weak. In *nitidithorax*, the outer style is much more strongly narrowed outwardly while the vestiture of the outer face of the inner style appears as conspicuous erect spines or spinous setae. Phallosome with outer portion shorter but wider than in *nitidithorax*, appearing transversely oval or virtually so.

Habitat. Utah.

Holotype. ♂, Dry Canon, Logan, June 24, 1938 (G. F. Knowlton & R. E. Nye). *Allotopotype.* ♀, pinned with type. *Paratopotypes.* 1 ♂, 1 ♀, with the type.

This interesting species is named in honor of Professor George F. Knowlton, to whom I am greatly indebted for numerous Tipulidae from Utah. The species is closest to the western Nearctic *Dactylolabis hortensia* (Alexander) and *D. nitidithorax* (Alexander). In the former, the very narrow praescutal stripes are four in number and more opaque dark brown, not or scarcely nitidous. In *nitidithorax*, the entire mesonotum is subnitidous dark brown or brownish black, the praescutum without evident stripes.

A NEW COLEOPHORID OF THE METALLIC-WINGED GROUP*

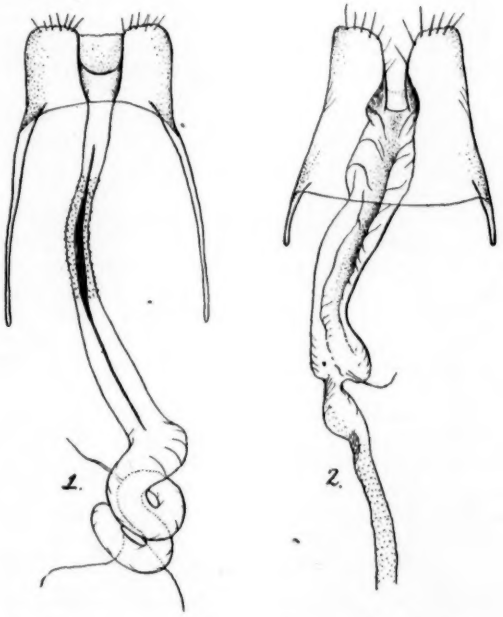
BY J. McDUNNOUGH,
Ottawa, Ont.

Coleophora maritella n. sp.

Palpi metallic blackish, smooth scaled, second joint with very slight apico-ventral tuft. Antennae simple, black, with apical seventh white, basal segments moderately swollen. Head smooth, metallic green. Primaries deep metallic green, tinged with cupreous apically, secondaries deep smoky. Legs deep smoky with a greenish metallic tinge. Expanse 8 mm.

Holotype—♀, Tabusintac, N. B., July 24, 1939 (W. J. Brown). No. 5207 in Canadian National Collection, Ottawa.

Paratypes—21 ♀'s, Tabusintac, N. B., July 24, 1939 (W. J. Brown and J. McDunnough).



Female genitalia of 1. *Coleophora maritella* n. sp. 2. *C. apicialbella* Brn.

From the only other North American species with white-tipped antennae, *apicialbella* Brn., the present species differs in its much smaller size and quite simple antennae. The genitalia are totally distinct from those of *apicialbella* as a reference to the figures will show. Unfortunately no males were captured but the female characters should be ample to differentiate the species; it is apparently allied to the European *alcyonipennella*, judging by Pierce's figure of the female genitalia of this species.

At the time of collecting I neglected to note the habitat but I have reason to believe that the series was swept from grass on the salt meadows adjacent to Tabusintac Bay.

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*Contribution No. 2076, Division of Entomology, Science Service, Department of Agriculture, Ottawa.

GLUPHISIA LINTNERI GROTE AND RELATED SPECIES (LEPIDOPTERA, NOTODONTIDAE)

BY JOHN G. FRANCLEMONT,

Cornell University, Ithaca, New York

After several seasons of collecting, it has become evident that *Gluphisia lintneri* Grote and *G. avimacula* Hudson, which both occur at Ithaca, are not forms of the same species, as they do not fly at the same time, *lintneri* being on the wing about a month before *avimacula*, the former occurring in late April and the latter in late May, and this lapse of time between the two periods of flight of the forms does not constitute enough for the production of two broods.

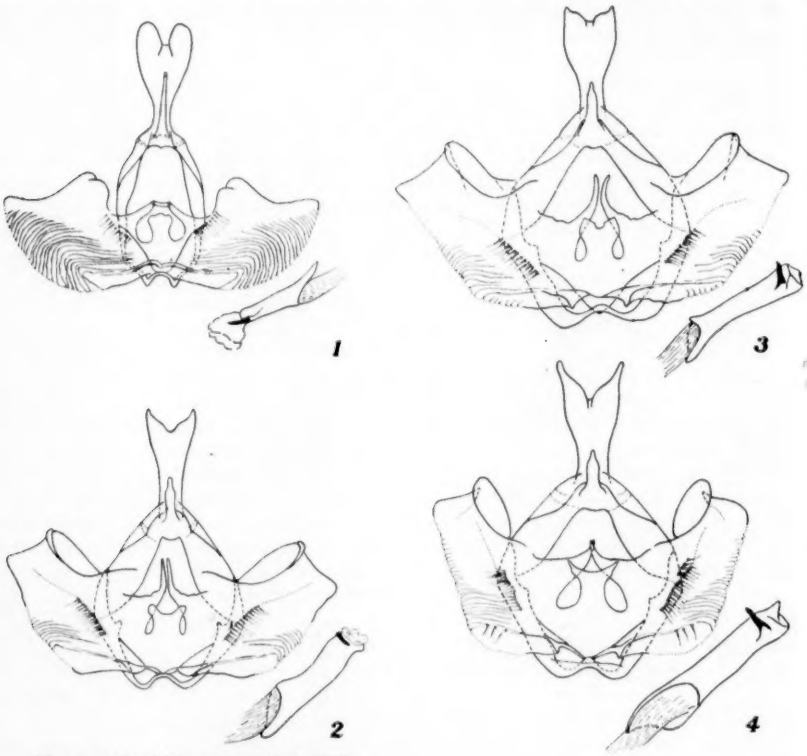

Fig. 1. *Gluphisia septentrionis* Wlk.
Fig. 2. *Gluphisia avimacula* Hudson.
Fig. 3. *Gluphisia lintneri* Grt.
Fig. 4. *Gluphisia severa* Hy. Edw.

With this fact before me, several genitalia slides of both forms were made, and it was found that, coupled with external differences and the different time of flight, the genitalia were constantly different. To make the survey complete, slides of the *severa* forms were made, and these were found to be still different and to represent a third species in the complex.

The following synoptic table gives the chief superficial differences between the three species and their forms. It must, however, be borne in mind that the genitalia offer the safest way of determining the three species in question.

a. Wings narrow, the apex subacute; eastern species.
   b. Larger, grayer, the discal mark not evident or at most very faint; pectinations of male antennae 2 mm. long ..... *lintneri* Grt.
      Median area of forewings between t. a. and t. p. lines suffused with blackish ..... female form *pretians* form nov.
   bb. Smaller, browner, the discal mark bright yellow and always evident; pectinations of the male antennae a little more than 1 mm. long ..... *avimacula* Hudson
      Median area of forewings between t. a. and t. p. lines suffused with blackish ..... female form *slossoniae* Pack.
aa. Wings broad, the apex rounded, shaggier looking, darker; antennal pectinations of male 2 mm. long; western species from the Rockies and the Pacific Coast.
   b. Discal mark rather evident and yellowish (apparently the commonest form) ..... *severa* form *normalis* Dyar
   bb. Discal mark not evident ..... *severa* form *danbyi* Neum.
   bbb. Median area of forewings between t. a. and t. p. lines suffused with blackish (a form occurring only in the females) ..... *severa* Hy. Edw.

The differences in the male genitalia of the three species may be summarized as follows:

1. Apex of uncus shallowly excavated, the lobes broadly acute; lobes of the transtilla long and acute; juxta broad, narrowly excavated, the lobes broad and squarely cut; the valves rectangular, about twice as long as wide ..... *lintneri* Grt

2. Apex of uncus moderately excavated; the lobes broadly acute; lobes of the transtilla long and acute; the juxta broad, widely excavated, the lobes narrow and rounded; the valves subquadrate, about one and one-half times as long as wide ..... *avimacula* Hudson

3. Apex of uncus deeply excavated, the lobes narrow and subacute; lobes of the transtilla broad, short and acute; the juxta broad, very widely excavated, the lobes acute and produced; valves rectangular, about three times as long as wide ..... *severa* Hy. Edw.

The genitalia of *Gluphisia septentrionis* Walker [*septentrion* (*al*) *is* Kirby *sic*] have been figured for comparison with the other species. The noticeable differences between this and the other species are the broad rounded lobes of the uncus, the very long narrow scaphium, the joined lobes of the transtilla, the non-emarginate uncus, the quadrate valves somewhat produced at the apex and the spine on the apical end of the aedoeagus, directed forward in this species, and curved around the apical end parallel to the opening in the other species.

Gluphisia lintneri form **pretians** form. nov.

Of the same ground color and with the normal markings of *lintneri* proper, but with the median area of the forewings between the t. a. and t. p. suffused with black. .

Holotype: ♀, Ithaca, New York, May 3, 1937 (J. G. Franclemont), [in Coll. Franclemont]. I have seen two other specimens of this form, but I do not know where they are at present.

This form differs from normal *lintneri* in the black median area and is a parallel form to *slossoniae* and *severa*.

It seems inadvisable at this time to attempt a discussion of the forms listed under *septentrionis* because my material is so very scant. I must, however, thank both Mr. Cyril F. dos Passos and Mr. William P. Comstock for photographs and notes on the Henry Edwards' types of this genus (*Gluphisia*) in the American Museum of Natural History. I wish also to extend my sincere thanks to Dr. A. Glenn Richards, Jr. for making the genitalia slides of these same types.

The three species and their forms discussed in this paper may be listed as follows:

GLUPHISIA Bdv.
lintneri Grt.
♀ *form* pretians Franc.
avimacula Hudson
♀ *form* slossoniae Pack.
severa (♀ *form*) Hy. Edw.
normal form normalis Dyar
form danbyi Neum.

FREDERICK WALLACE EDWARDS

Just before the annual meetings of the entomological societies in December, 1940, the first news of the death of Fred W. Edwards reached America. It seemed to me, at Philadelphia, that no single subject was discussed so much and with so many expressions of real sorrow and regret, as was this sad occurrence. The brief published accounts are incorrect in certain important details, and a short notice of his life and activities is herewith provided.

The advices that have come to hand indicate that Edwards passed away from a chronic illness on November 15, 1940, presumably at his home in Letchworth, Herts, England. Frederick Wallace Edwards was born at Old Fletton, Huntingtonshire, a suburb of Peterborough, Northamptonshire, on November 28, 1888. He was the son of Cephas Luther and Automella (Sargent) Edwards, on the father's side his ancestors having been of Welsh extraction, on his mother's of Huguenot. He attended Secondary School at Cambridge, 1901–1906, and Christ College, Cambridge University, 1906–1909, with an extra year of Agriculture in 1910. Still later, Cambridge University awarded him the degree of Doctor of Science. He passed the civil service examination for Second Class Assistant in Zoology at the British Museum (Natural History), joining the staff on November 24, 1910. During the thirty years of service he was advanced regularly until, at the time of his death, he was one of the Keepers of the Museum, in charge of the Diptera and some related fields.

On September 21, 1911, Edwards married Florence Mary Williams, of Shelford, Cambridge, at Shelford. The widow, with three daughters,—Joan (born 1915), Hazel (1921), and Iris (1924)—survive. During his life Edwards made several trips to continental Europe, either for the purpose of collecting or of studying type materials. In 1913 he visited Switzerland; at Easter 1923, Paris, examining the extant types of Meigen and Macquart; in July 1923, six weeks in Scandinavia, collecting and studying the types of Zetterstedt, Fabricius, Fallen, and Staeger; in 1924, Holland, examining the types of van der Wulp and de Meijere. In 1925 he took an extended collecting trip, with Barnes, in Switzerland, the Black Forest, and the Tyrol, attending the Entomological Congress at Zurich, and studying the Winnertz types at Bonn. In 1926, he took his first trip abroad, sailing on September 23 from Tilbury for Buenos Aires, where he and Mrs. Edwards arrived on October 16, being met at the dock by Raymond and Elnora Shannon. The party left three days later for southern Patagonia, leaving southern Chile on the return trip on December 25. The results of the Edwards-Shannon expedition to Patagonia and South Chile have been published in a series of volumes and parts that has revolutionized our knowledge of the Diptera of the region (British Museum, 1929–date).

At Easter, 1928, the Edwards spent three weeks in Corsica; in July he made his only visit to the United States and Canada while a delegate to the Fourth International Entomological Congress at Ithaca, New York. At this time, the

Edwards spent five days with me at Amherst, August 7–11. At the conclusion of the Congress they visited Dyar in Washington, sailing for home at the end of August. In 1929, trips were made to the English Lake District (Windermere) and to Killarney, Ireland; in 1931, to Rannoch, Scotland; in 1932, again to Scotland and to the Entomological Congress at Paris; in 1933, to Germany and Latvia, visiting Lackschewitz in August; in 1934, to Scotland and to Pembrokeshire in south Wales. In 1934-1935, Edwards took his third and last trip abroad, this time as joint leader of the British Museum Ruwenzori Expedition to the high mountains of tropical Africa, the scientific results of which are now being published by the authorities of the British Museum. Later in 1935, he made a trip to Spain, while attending the Sixth International Entomological Congress, with brief opportunities for collecting in the Pyrenees.

In later years, more and more of his summer vacations were spent with his wife and daughters in various parts of Britain.

As early as February, 1939, there began the series of fears and worries that reached a culmination in the outbreak of the actual hostilities of the present war. My last letter from him, dated September 22, 1940, gave a slight hint of his condition, when he indicated that he had been to the doctor for indigestion but that he did not believe anything very serious was wrong. Thus ended a series of letters dating from the earliest days at the Museum in 1911.

It is impossible to state at this time how many papers Edwards has published, or how many new species he has described. In December, 1931, he gave an estimate of possibly 175 papers, and it seems certain that his total will far exceed 200, all of the very highest calibre. Edwards had a most remarkable eye for detailed and important characters in insects. A seemingly casual glance appeared sufficient to impress on his mind all the essential characters of a given species. While visiting me at Amherst in 1928, I had ample opportunity to watch his methods. During the few days he was here, he examined hundreds of cases of specimens, carefully scrutinizing the contents of each and jotting down an occasional note. The result was an almost incredible knowledge of the contents, sufficient to provide hours of discussion on a given species or group of forms. If there is anything like a "photographic eye" then certainly Edwards possessed such to a marvellous degree.

Fred Edwards has passed on, but the work that he has accomplished and his influence on a host of fellow workers in the Diptera will remain indefinitely. His world-wide grasp of many of the most difficult families in the Nematocera,—the Tipulidae, Culicidae, Chironomidae, Cecidomyiidae, Mycetophilidae, Blepharoceridae, and others—has assured him of a high ranking in the brilliant group of Dipterologists who have passed on, including among others of somewhat comparable attainments, Meigen, Wiedemann, Zetterstedt, Macquart, Loew, Osten-Sacken, Schiner, Skuse, Verrall, Kertész, Bezzi, Williston, Aldrich, and Lackschewitz. One cannot but wonder when the World will see another of the brilliant attainments of Fred Edwards.

C. P. Alexander,
Amherst, Mass.

COLLECTING OF THE RARE WATER BEETLE *LACCORNIS DIFFORMIS* (LEC.) BY THE LATE CH. ROBERTS.

In the *Canadian Entomologist* for June, 1940, I gave a review of the Nearctic species of *Laccornis,* and mentioned that few persons seem to have taken specimens in numbers. More recently I have noted a reference in *Entomological News,* 19 (8): 392-393 (October, 1908), in which J. A. Grossbeck reports an address, on how and where to collect aquatic Coleoptera, given before the Newark Entomological Society by Mr. Roberts. Following is an excerpt: "One of the best places to collect is along the edges of shallow water areas among the vegetable mould and old leaves. The material is swept up with a net, placed on a cloth as above described, and broken up into small pieces in order that desiccation may begin promptly. At first the mass may seem devoid of life, but as the material becomes dry, the beetles will begin to emerge. In this way Mr. Roberts has taken hundreds of *Hydroporus difformis* which until then had been regarded as an extremely rare insect." See also J. D. Sherman, Jr., Jour. New York Ent. Soc., 21 (1):48 (March, 1913).

Hugh B. Leech, Vernon, B. C.

THE MALE OF *HYDROPORUS COELAMBOIDES*

Hydroporus coelamboides Fall* was described from two examples taken at Alburquerque, New Mexico; these specimens were presumed to be males. To the best of my knowledge the species has not been found since, except for a series taken by myself, while on a collecting trip in the Mojave Desert, with P. C. Ting and M. A. Cazier.

Our specimens were sieved out of a roadside pool at Mojave Water Camp, about twenty miles southeast of Daggett, Calif., on Highway 66. The males agree with the description of *panaminti* Fall on crural characters, while the females refer correctly to *coelamboides* in the key; this suggested that the types of the latter were actually both females. The late Dr. H. C. Fall was so kind as to compare a pair of the Mojave Water Camp series with the types of *coelamboides* and *panaminti,* and found that they were the former. An examination of the seventy-nine specimens of the two species at hand shows that the characters in Fall's key cannot be relied upon. The following couplet is offered as a substitution.

14. Size larger (average of 30 specimens, 4.35 x 2.19 mm.); elytra dull, surface deeply reticulated between the punctures which are separated by their own widths or less; mesofemora of males broad in apical third, thence somewhat sinuately narrowed towards base on inner side, the inner margin sharp and blade-like ..... *coelamboides*

Size smaller (average of 49 specimens, 3.55 x 1.69 mm.); elytra moderately shining, surface finely reticulated between the punctures which are separated by more than their own widths; mesofemora of males as in *coelamboides* ..... *panaminti*

Hugh B. Leech, Vernon, B. C.

*Fall, H. C., 1923. A revision of The North American species of Hydroporus and Agaporus. Privately printed. Page 110.

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